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**REMOVAL SITE EVALUATION PLANT 5 PAD
SOIL AND RUBBLE PILE MAY 1991**

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REMOVAL SITE EVALUATION
PLANT 5 PAD SOIL AND RUBBLE PILE

Fernald Site Office
U. S. Department of Energy

May 1991

INTRODUCTION

A soil and rubble pile containing approximately 550 cubic yards of material, an estimated 60 percent being concrete rubble, is located outside of the northwest corner of Plant 5 and south of the Plant 5 Casting Area Storage Pad (Figure 1). This soil and construction rubble was generated during the excavation/renovation work on the Plant 5 Casting Area Storage Pad, Project Number Title 00-87502-1.1.2.1.02. The project was initially planned to remove the top 0.25 inch of the old pad followed by resurfacing with an additional 4 inches of concrete. However, it was determined that the radiological characteristics of the old concrete was too high to remain in place, and thus the pad was completely replaced.

The Plant 5 Casting Area processed depleted, natural, and 0.95 percent enriched uranium. There was no thorium processed in the plant. The Plant 5 Casting Area Storage Pad was used for the storage of materials for these processes. The following are examples of the types of materials stored on the pad: uranium ingots, derbies, briquettes, remelt materials, sawchips, U_3O_8 , floor sweepings, ceramics, and graphite.

Based on process knowledge there were no hazardous materials (RCRA materials) stored on the Plant 5 Casting Area Storage Pad. According to the AEDO Spill Data Base, there were no spills of solvents, paints, fuels, lubricants, cleaners, or any other chemicals on the storage pad. Also, based on the FMPC Weed Control Program File 1970 through 1990, herbicides were not placed on or near the pad.

SOURCE TERM

Field Investigation

Soil samples were taken at three locations from under the old Plant 5 Casting Area Storage Pad. Two samples at depths of 0 to 6 inches, and 6 to 12 inches were taken at each location. The samples were analyzed for thorium 228, total uranium, and EP-Toxicity metals (see Tables 1 and 2 for results).

After the determination that all of the concrete from the pad had to be removed, eleven additional soil and twelve concrete samples were taken. The samples were only analyzed for total uranium, due to process knowledge and the EP-Toxicity results for the samples mentioned above (see Table 3 for results).

Contaminant Release

Presently, the rubble pile from the construction/demolition of the Plant 5 pad is subjected to erosion from wind and surface water run-off. This erosion can potentially release uranium and thorium-228 to the environment, which are the only contaminants of concern due to process knowledge and sample results.

EVALUATION OF THE MAGNITUDE OF THE POTENTIAL THREAT

The uranium concentrations for the samples taken for the Plant 5 pad project range from 13 pCi/g to 530 pCi/g for total uranium with a mean value of 112.3 pCi/g. This value makes the soil and rubble in the stock pile for the project exceed Category II levels set by FMPC-720¹. Therefore, the entire soil and rubble pile will be boxed and handled in accordance with FMPC-720. In order to significantly reduce the potential threat of contaminant releases during the boxing of the soil and rubble, the following control measures will be administered:

1. Soil boxes will be placed on plastic to prevent possible migration during soil boxing activities.
2. In the event that the soil has dried to the point where dusting is possible, the soil will be re-wetted.
3. Dispositioning/handling of the soil shall be performed during non-peak personnel traffic times and/or by using appropriate measures to detour traffic away from the area.
4. Final soil dispositioning shall be in accordance with radiological guidelines specified in FMPC-720, specific requirements noted within this RSE, and site zoning procedures.
5. After the soil and rubble pile has been removed and boxed, four verification samples will be taken from the surface on which the pile was located. This will be done to insure that all contaminants, including possible leached contaminants from the pile, have been removed. The sample location will be determined in the field and then documented.

¹FMPC Site Procedure, FMPC-720, "Control of Construction Waste", issued November 10, 1988.

ASSESSMENT ON THE NEED FOR A REMOVAL ACTION

Consistent with Section 40 CFR 300.410 of the National Contingency plan, the Department of Energy (DOE) shall determine the appropriateness of a removal action. Eight factors to be considered in this determination are listed in 40 CFR 300.415 (b)(2). The following applies specifically to the concentrations of contaminants in the Soil and Rubble Pile from the Plant 5 Pad Excavation/Demolition Project:

40 CFR 300.415 (b)(2)(iv)

High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

This factor is considered appropriate as a result of the concentration of contaminants in the Soil and Rubble Pile From the Plant 5 Pad Excavation/Demolition Project.

APPROPRIATENESS OF A RESPONSE

If a planning period of less than six months exists prior to initiation of a response action, DOE will issue an Action Memorandum. The Action Memorandum will describe the selected response and provide supporting documentation for the decision.

If it is determined that there is a planning period greater than six months before a response is initiated, DOE will issue an Engineering Evaluation/Cost Analysis (EE/CA) Approval Memorandum. This memorandum is to be used to document the threat of public health and the environment and to evaluate viable alternative response actions. It will also serve as a decision document to be included in the Administrative Record.

Based on the evaluation of all of the above factors, it has been determined that existing controls for the planned action are adequate and a removal action is not required.

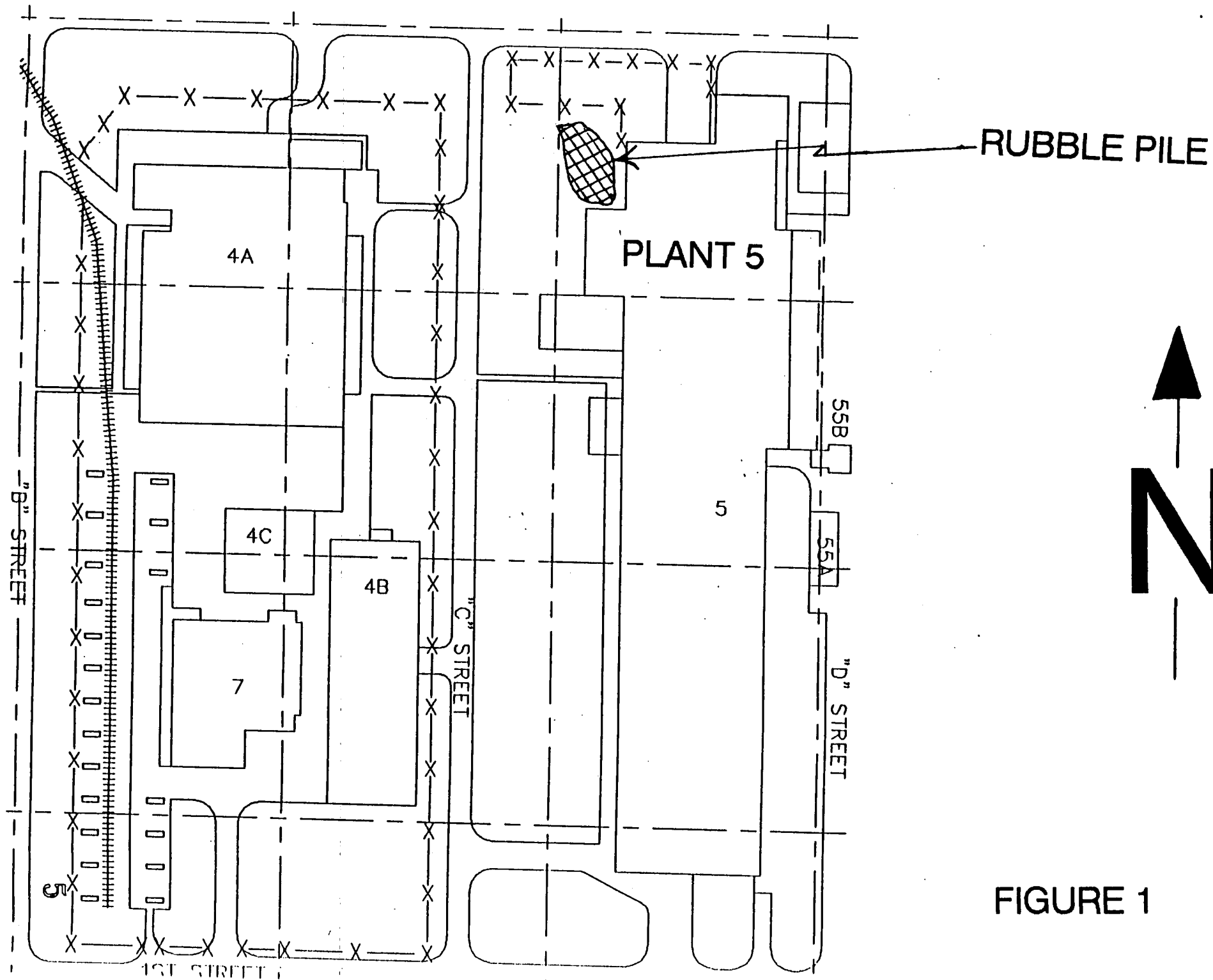


FIGURE 1

Table 1

Radiological Analysis for Soils
Prior to Excavation
(pCi/g)

Sample No	Depth	Total Uranium	Th-228
RC0086	0" - 6"	80	0.46
RC0087	0" - 6"	29	0.38
RC0088	0" - 6"	84	1.10
RC0130	6" - 12"	11	< 5
RC0131	6" - 12"	18	< 5
RC0132	6' - 12"	106	< 5

Table 2

EP-Toxicity Metals for Soils
Prior to Excavation (pCi/g)

Sample No.	Depth	Ag	As	Hg	Pb	Se	Ba	Cd	Cr
RC0086	0"-6"	< 1	< 1	< 0.1	< 1	< 0.1	< 25	< 0.2	< 1
RC0087	0"-6"	< 1	< 1	< 0.1	< 1	< 0.1	< 25	< 0.2	< 1
RC0088	0"-6"	< 1	< 1	< 0.1	< 1	< 0.1	< 25	< 0.2	< 1
RC0130	0"-12"	.009	.007	.00002	.009	.016	.678	.003	.063
RC0131	0"-12"	.008	.009	.00008	.002	.016	.426	.001	.138
RC0132	0"-12"	.010	.006	.00002	.0003	.016	.601	.001	.084

Table 3
Concrete Samples
After Determination For
Pad Removal
 (pCi/g)

Sample No.	Total U	Sample No.	Total U
C-1	530	C-7	180
C-2	140	C-8	340
C-3	210	C-9	310
C-4	160	C-10	91
C-5	120	C-11	260
C-6	130	C-12	90

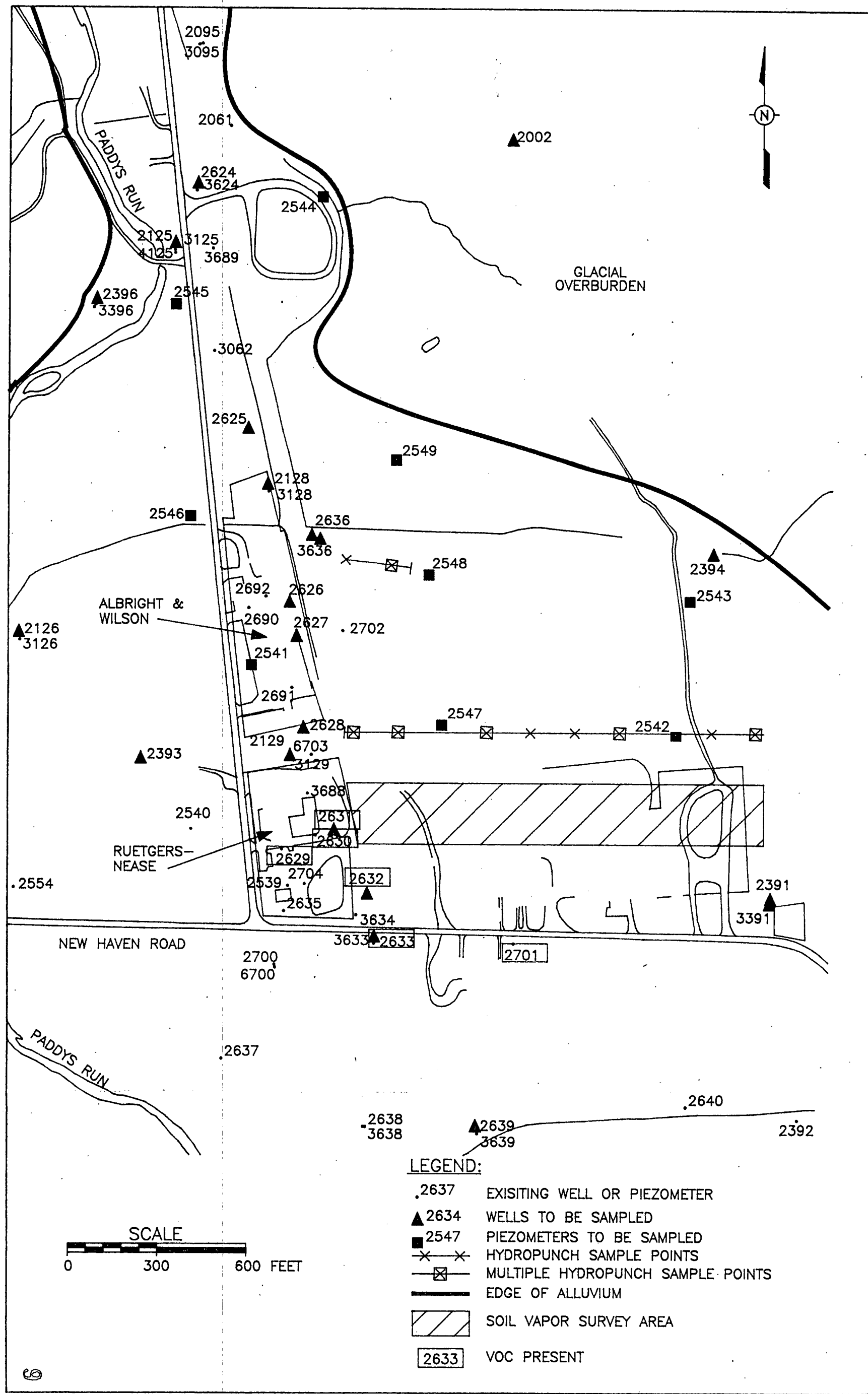
Table 4
Soil Samples
After Determination For
Pad Removal
 (pCi/g)

Sample No.	Total U	Sample No.	Total U
S-1	19	S-7	68
S-2	13	S-8	19
S-3	23	S-9	31
S-4	67	S-10	83
S-5	13	S-11	20
S-6	13	---	

Table 5
EP Toxicity Constituents
And Maximum Concentrations,
40 CFR 261.24, Table 1

EPA Hazardous Waste No.	Constituent	Maximum Concentration (mg/l)
D004	As	5.0
D005	Ba	100.0
D006	Cd	1.0
D007	Cr	5.0
D008	Pb	5.0
D009	Hg	0.2
D010	Se	1.0
D011	Ag	5.0

FIGURE 2. PROPOSED SAMPLING LOCATIONS



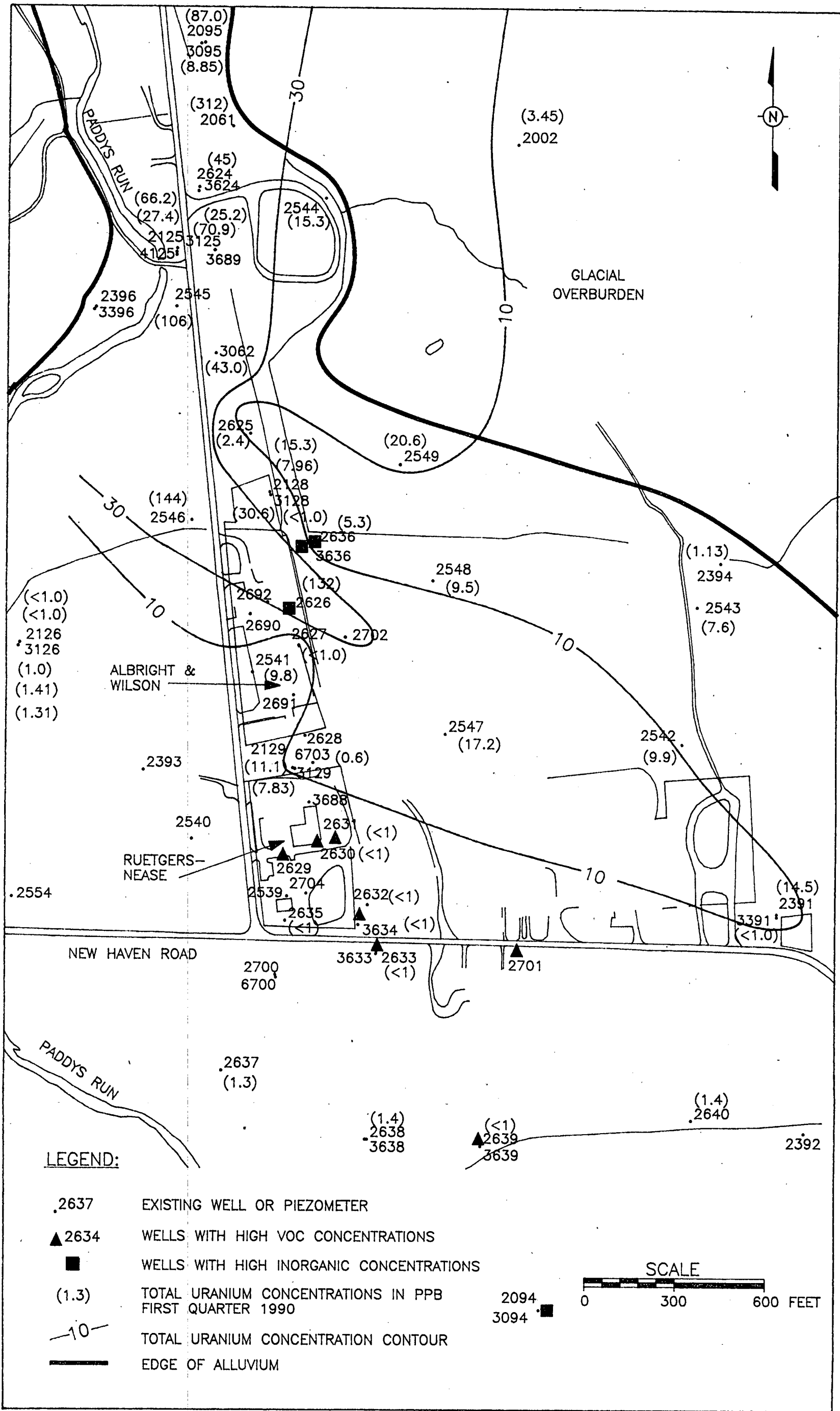


FIGURE 1. SOUTH PLUME
AREA DATA
APRIL-MAY, 1990